

# National Journal

December 13, 1823...No. 3.

[EXTRA.]

## RULES OF CONGRESS.

[CONTINUED FROM FOLIO 17.]

### Standing Rules and Orders for conducting business in the House of Representatives of the United States.

#### TOUCHING THE DUTY OF THE SPEAKER.

1. He shall take the chair every day precisely at the hour to which the House shall have adjourned on the preceding day; shall immediately call the members to order, and, on the appearance of a quorum, shall cause the journal of the preceding day to be read.

2. He shall preserve decorum and order; may speak to points of order in preference to other members, rising from his seat for that purpose, and shall decide questions of order, subject to an appeal to the House by any two members; on which appeal no member shall speak more than once, unless by leave of the House.

3. He shall rise to put a question, but may state it sitting.

4. Questions shall be distinctly put in this form: to wit: "As many as are of opinion that (as the question may be) say ay;" and, after the affirmative voice is expressed, "As many as are of the contrary opinion say no." If the Speaker doubts, or a division be called for, the House shall divide: those in the affirmative of the question shall first rise from their seats, and afterwards those in the negative. If the Speaker still doubts, or a count be required, the Speaker shall name two members, one from each side, to tell the members in the affirmative, which being reported, he shall then name two others, one from each side, to tell those in the negative, which being also reported, he shall rise and state the decision to the House.

5. When any motion or proposition is made, the question, "Will the House now consider it?" shall not be put, unless it is demanded by some member, or is deemed necessary by the Speaker.

6. The Speaker shall examine and correct the journal before it is read. He shall have a general direction of the hall. He shall have the right to name any member to perform the duties of the chair, but such substitution shall not extend beyond an adjournment.

7. All committees shall be appointed by the Speaker, unless otherwise specially directed by the House, in which case they shall be appointed by ballot; and, if upon such ballot, the number required shall not be elected by a majority of the votes given, the House shall proceed to a second ballot, in which a plurality of votes shall prevail; and, in case a greater number than is required to compose or complete a committee shall have an equal number of votes, the House shall proceed to a further ballot or ballots.

8. In all other cases of ballot than for committees, a majority of the votes given shall be necessary to an election; and when there shall not be such a majority on the first ballot, the ballot shall be repeated until a majority be obtained.

9. In all cases at ballot by the House, the Speaker shall vote; in other cases he shall not vote, unless the House be equally divided, or unless his vote, if given to the minority, will make the division equal; and, in case of such equal division, the question shall be lost.

10. In all cases where other than members of the House may be eligible to any office by the election of the House, there shall be a previous nomination.

11. All acts, addresses, and joint resolutions, shall be signed by the Speaker; and all writs, warrants, and subpoenas, issued by order of the House, shall be under his hand and seal, attested by the Clerk.

12. In case of any disturbance, or disorderly conduct in the galleries or lobby, the Speaker (or chairman of the committee of the whole House,) shall have power to order the same to be cleared.

13. No person except members of the Senate, their Secretaries, Heads of Departments, the Treasurer, Comptroller, Register, Auditor, Postmaster General, President's Secretary, Chaplains to Congress, Judges of the United States, foreign Ministers and their Secretaries, officers, who, by name, have received, or shall hereafter receive, the thanks of Congress for their gallantry and good conduct displayed in the service of their country, the Commissioners of the Navy Board, Governor, for the time being, of any state or territory in the Union, who may attend at the seat of the general government during the sessions of Congress, and who may choose to avail himself of such privilege, such gentlemen as have been heads of departments, or members of either branch of the legislature, and, at the discretion of the speaker, persons who belong to such legislatures of foreign governments as are in amity with the United States, shall be admitted within the hall of the House of Representatives.

14. Stenographers, wishing to take down the debates, may be admitted by the Speaker, who shall assign such places to them, on the floor or elsewhere, to effect their object, as shall not interfere with the convenience of the House.

#### Order of business of the Session.

15. After six days from the commencement of a second or subsequent Session of any Congress, all bills, resolutions, and reports, which originated in this House, and at the close of the next preceding session remained undetermined, shall be resumed and acted on in the same manner as if an adjournment had not taken place.

#### Order of business of the day.

16. As soon as the journal is read, the Speaker shall call for petitions from the members of each state, and delegates from each territory, beginning with Maine; and if, on any day, the whole of the states and territories shall not be called, the Speaker shall begin on the next day where he left off the previous day. Provided, that, after the first thirty days of the Session, petitions shall not be received except on the first day of the meeting of the House in each week.

17. The petitions having been presented and disposed of, reports, first from the standing, and then from the select committees, shall be called for, and disposed of. And not more than one hour in each day shall be devoted to the subject of reports from committees, and resolutions; after which the Speaker shall dispose of the bills, messages, and communications, on his table, and then proceed to call the orders of the day.

The above business shall be done at no other part of the day, except by permission of the House.

#### Of Decorum and Debate.

18. When any member is about to speak in debate, or deliver any matter to the House, he shall rise from his seat, and respectfully address himself to Mr. Speaker, and shall confine himself to the question under debate, and avoid personality.

19. If any member, in speaking, or otherwise, transgress the rules of the House, the speaker shall, or any member may, call to order; in which case the member so called to order shall immediately sit down, unless permitted to explain, and the House shall, if appealed to, decide on the case, but without debate, if there be no appeal, the decision of the chair shall be submitted to. If the decision be in favour of the member called to order, he shall be at liberty to proceed; if otherwise, he shall not be permitted to proceed without leave of the House; and, if the case require it, he shall be liable to the censure of the House.

20. When two or more members happen to rise at once, the Speaker shall name the member who is first to speak.

21. No member shall speak more than twice to the same question, without leave of the House, nor more than once until every member choosing to speak shall have spoken.

22. Whilst the Speaker is putting any question, or addressing the House, none shall walk out of, or across, the House; nor in such case, or when a member is speaking, shall entertain private discourse; nor, whilst a member is speaking, shall pass between him and the chair.

23. No member shall vote on any question in the event of which he is immediately and particularly interested; or in any case where he was not present when the question was put.

24. Upon a division and count of the House, on any question, no member without the bar shall be counted.

25. Every member who shall be in the House when the question is put, shall give his vote, unless the House, for special reasons, shall excuse him.

26. When a motion is made and recorded, it shall be stated by the Speaker, or, being in writing, it shall be handed to the chair, and read aloud by the Clerk, before debated.

27. Every motion shall be reduced to writing, if the Speaker or any member desire it.

28. After a motion is stated by the Speaker, or read by the Clerk, it shall be deemed to be in the possession of the House; but may be withdrawn at any time before a decision or amendment.

29. When a question is under debate, no motion shall be received, but to adjourn, to lie on the table, for the previous question, to postpone to a day certain, to commit, or amend, to postpone indefinitely; which several motions shall have precedence in the order in which they are arranged; and no motion to postpone to a day certain, to commit, or to postpone indefinitely, being decided, shall be again allowed on the same day, and at the same stage of the bill or proposition. A motion to strike out the enacting words of a bill, shall have precedence of a motion to amend, and, if carried, shall be considered equivalent to its rejection.

30. When a resolution shall be offered, or a motion made, to refer any subject, and different committees shall be proposed, the question shall be taken in the following order:

The committee of the whole House on the state of the Union; the committee of the whole House; a standing committee; a select committee.

31. A motion to adjourn shall be always in order, after 4 o'clock P. M.; but before that hour it shall not be in order, if there be at the time any question pending before the House; that, and the motion to lie on the table, shall be decided without debate.

32. The previous question shall be in this form: "Shall the main question be now put?" It shall only be admitted when demanded by a majority of the members present; and, until it is decided, shall preclude all amendment, and further debate of the main question.

33. On a previous question, there shall be no debate.

34. When a question is postponed indefinitely, the same shall not be acted upon again, during the session.

35. Any member may call for the division of a question, which shall be divided if it comprehends questions so distinct that, one being taken away, the rest may stand entire for the decision of the House. A motion to strike out and insert shall be deemed indivisible; but, a motion to strike out being lost, shall preclude neither amendment, nor a motion to strike out and insert.

36. Motions and reports may be committed at the pleasure of the House.

37. No motion or proposition, on a subject different from that under consideration, shall be admitted, under colour of amendment.

38. When a motion has been once made, and carried in the affirmative or negative, it shall be in order for any member of the majority to move for the reconsideration thereof, on the same or the succeeding day.

39. When the reading of a paper is called for, and the same is objected to by any member, it shall be determined by a vote of the House.

40. The unfinished business in which the House was engaged at the last preceding adjournment, shall have the preference in the orders of the day; and no motion on any other business shall be received, without special leave of the House, until the former is disposed of.

41. If a question depending be lost by adjournment of the House, and revived on the succeeding day, no member who shall have spoken twice on the preceding day, shall be permitted again to speak, without leave.

42. Every order, resolution, or vote, to which the concurrence of the Senate shall be necessary, shall be read to the House, and laid on the table, on a day preceding that in which the same shall be moved, unless the House shall otherwise expressly allow.

43. Petitions, memorials, and other papers, addressed to the House, shall be presented by the Speaker, or by a member in his place; a brief statement of the contents thereof shall verbally be made by the introducer, and shall not be debated or decided on the day of their being first read, unless where the House shall direct otherwise; but shall lie on the table, to be taken up in the order they were read.

[Continued to folio 49.]



## THE CONGRESS.

FIRST SESSION, EIGHTEENTH CONGRESS.

### Documents.

*Documents accompanying the Message of the President of the United States, to both Houses, at the commencement of the first Session of the Eighteenth Congress.*

DOCUMENTS FROM THE WAR DEPARTMENT.

[CONTINUED FROM FOLIO 24.]

#### A.

Amount of Funds remitted to Officers of the Quartermaster's Department, in the year 1822, and the amount for which accounts were rendered for that year.

Amount remitted in the first quarter of the year,	\$56,655
Do. do. second quarter,	148,418
Do. do. third quarter,	81,334
Do. do. fourth quarter,	79,608
	366,015
Amount received by officers from the sales of public property authorized during the year,	9,168
	\$375,183

Amount disbursed per accounts rendered for the first quarter,	60,683
Do. do. do. second quarter,	117,426
Do. do. do. third quarter,	77,838
Do. do. do. fourth quarter,	92,542
	348,849
Excess of remittances, &c. beyond the actual disbursements of the year,	\$26,694

**NOTE.** In consequence of the short appropriation for 1821, there were no funds of consequence in the hands of officers at the close of that year to be taken into view in this statement. The above excess was in the hands of the officers of the Department at the expiration of the year 1822, and was carried to the service of the year 1823. The public property noticed above as sold, consisted of various small articles of supplies which had become damaged from unavoidable accidents or of no further use.

#### B.

Amount of funds remitted to the Officers of the Quarter-Master's Department in the three first quarters of the year 1823, and the amount for which accounts have been rendered for the same period.

Amount in the hands of the several Officers, from the year 1822,	\$26,694 00
Amount remitted in the first quarter, of 1823,	52,570 00
Do. do. second quarter,	71,450 00
Do. do. third quarter,	98,648 00
Amount received by Officers from the sales of public property, authorized during the period embraced above	2,122 00
	251,484 00
Amount disbursed, per accounts rendered for the first quarter,	61,617 02
Do. second quarter,	89,161 93
Do. third quarter,	79,112 36
	229,891 31
Excess of remittances,.....	\$21,592 69

**NOTE.** The above excess is made up of small unexpended balances in the accounts of the several Offices at the close of the third quarter, which have been carried to the service of the succeeding quarter. The amount was, on the 30th September, chiefly deposited in the various Banks designated for the reception of public funds. The residue was in the hands of Officers stationed remote from those institutions.

#### C.

Report of the Commissary General of Subsistence, with Statements A. and B. Office of the Com. Gen. of Sub. Washington, Nov. 22, 1823.

Sir: In obedience to your orders of the 7th April last, and 5th inst. I have the honor of presenting to your view two statements; the one marked A, exhibiting the expenditures in this Department for the entire year 1822, and that marked B, showing the disbursements in the three first quarters of 1823

The whole amount remitted and charged in the year 1822, is \$284,764 11; the amount disbursed and accounted for, \$270,850 46; leaving a balance of \$13,913 65, from which the following sums are to be deducted, viz: \$73 83 in the hands of the Assistant Commissary at Fort Osage, received by him in paper of the Edwardsville Bank; \$6,500 remitted to the Assistant Commissary at New-Orleans, on the 28th of December, 1822, only three days previous to the expiration of the year, and intended to meet the expenditures of the 1st quarter of 1823; \$861 69, the amount of provisions actually purchased and issued to the troops; but, for which purchase, the vouchers have been lost on their route to this place.

These three sums, collectively, deducted from \$13,913 65, will leave a balance of \$6,478 13, to be accounted for in the first quarter of 1823; and the whole of which, including the \$6,500 remitted to the Assistant Commissary at New-Orleans, on the 28th of December, 1822, has been accounted for in the first quarter of the present year.

The whole amount remitted and charged in the three first quarters of 1823, is \$276,519 70; the amount disbursed and settled, \$254,278 93, leaving a balance of \$22,240 77.

It may not be improper for me to remark, that, owing to the great distance which the military stations on the Upper Lakes, Upper Mississippi, and Red River, are from any post route, that the accounts for the third quarter of the year have not yet been received from those posts; it is, however, justly due to the Assistant Commissaries and Agents of the Department, to state, that their accounts and returns are promptly and regularly rendered; and that of the moneys charged and disbursed in 1822, the loss of one cent has not accrued to the United States; and there is every reason to believe, that the same will be the result of the disbursements for 1823.

GEORGE GIBSON, Com. Gen. of Sub.

The Hon. J. C. CALHOUN, Secretary of War.

#### D.

Report of the Paymaster General.

Paymaster General's Office, War Department, Nov. 20th, 1823.

Sir: In obedience to your instructions, I have the honor to report that, in the year 1822, there was drawn from the Treasury on warrants in favor of Paymasters of the army of the United States, the sum of nine hundred and eighteen thousand two hundred and seventy-five dollars and seventy-four cents, the whole of which was expended in paying the troops, and has been accounted for.

I have also the honor to submit a statement of the sums received by the several Paymasters in the three first quarters of the present year, the amount unexpended and applicable to the payments of the fourth quarter, and the balance not yet accounted for.

I am confident, from the reports of the Paymasters, that, by this time, all the troops have been paid to the first of September, the officers generally and several companies to the first of November, and that the accounts will be received before the close of the year.

N. TOWSON, Paymaster General.

Hon. J. C. CALHOUN, Secretary of War.

#### E.

Report of the Surgeon General.

Surgeon General's Office, November 24, 1823.

Sir: In compliance with your orders, I have the honor to state, that the amount disbursed on account of the Medical Department, in the three first quarters of the present year, was \$15,056. All the bills presented during this period, have been paid; all moneys advanced have been expended, and were regularly and satisfactorily accounted for, without loss to the United States; and but \$200 have been advanced during the present quarter.

The supplies for the year were forwarded to the several posts at an early period; and were in general reported to have been received in good order, and to be of a good quality. They also appear to have been abundant in quantity, an extra requisition having been made at but few posts, in consequence of an unexpected increase of the number of troops, or unusual expenditure from the prevalence of summer complaints.

Nearly all the surgeons have been constantly on duty during the year, with the exception of those confined by sickness; and the furloughs granted have been for short periods. Returns have regularly been made of every article of public property under their

charge, the quar sick.

With have in all other 43, of w From other so furnishe covery try of the soldier could ha

Hon. J.

Statement

To amo tary Com temb By amo quar Com Seco By do. By amo ter ditor By a tra chas mad

Statement the y Wool

To am Dep cond To am tary Irvis to th No.

By am quan C. Lee part By am ter tor,

Cost Forag Leath Oil cl Pomp Bands Cock Cap Cap S Wors Grey Drill



charge, and on examination, have been found strictly correct, and the quantity expended to be duly proportionate to the reports of sick.

With the exception of those stationed at Baton Rouge, the troops have in general been healthy. The number of deaths reported at all other posts, during the two first quarters of the year, was but 43, of which seven were from casualties.

From the returns and reports of the Surgeons, as well as from other sources of information, it appears that the hospitals are well furnished with every thing necessary for their comfort and recovery of the sick; and from the talents, acquirements, and industry of the medical attendants, it is confidently believed, that the soldier has now a much better opportunity for recovery, than he could have in any other situation in which would probably be placed.

JOS. LOVELL, Surgeon General.

Hon. J. C. CALHOUN.

#### F.

Statement of the Commissary General of Purchases—3, 4 & 5.

#### No. 3.

Statement of moneys received and disbursed during the three first quarters of the year 1823, on account of the Purchasing Department  
Commissary General's Office, Philadelphia, November 15, 1823.

To amount of sundry warrants issued by the Secretary of the Treasury, in favor of Callender Irvine, Comm'y General of Purchases, to the 30th of September, 1823, as per statement, No. 1.	\$116,206 00
By amount of disbursements during the first quarter of 1823, passed to the credit of the Commissary General by William Lee, esq. Second Auditor, Treasury Department, \$33,282 08	
By do. during the second quarter of 1823, 35,825 31	
By amount of my accounts for the third quarter of 1823, now before the Second Auditor for settlement, 23,612 98	
By a transfer to the appropriation for the purchase of woollens for 1823, directed to be made, per Wm. Lee, 2d Auditor 30,059 05	
	122,779 42

#### No. 4.

Statement of moneys received and disbursed during the three first quarters of the year 1823, on account of "appropriation of 1822, for the purchase of Woollens, for 1823."

To amount of transfer from the Purchasing Department, per order of Wm. Lee, Second Auditor, \$30,059 05	
To amount of warrant issued by the Secretary of the Treasury, in favor of Callender Irvine, Commissary General of Purchases, to the 30th Sept. 1823, as per Statement No. 2, 22 600 00	
	\$52,659 05
By amount of purchases during the second quarter of 1823, passed to the credit of C. Irvine, Commissary General, per Wm. Lee, Esq. Second Auditor, Treasury Department, \$20,123 99	
By amount of my account for the third quarter of 1823, now before the Second Auditor, for settlement, 24,350 95	
	\$44,474 94

#### No. 5.

Cost of Clothing for the Army of the United States, during the year 1824.

Forage Cap, - - - \$ 0 40	Cotton Shirts, privates, 0 72
Leather Cap, - - - 1 50	Ditto - sergeants, 0 75
Oil cloth, cap cover, - 0 45	Flannel Shirts, - - - 1 27 1/2
Pompons, - - - 0 20	Flannel Drawers, - - - 1 00
Bands and Tassels, - - 0 12	Fatigue Frocks, - - - 1 10
Cockades and Eagles, - 0 61	Fatigue Trowsers, - - 0 78 1/2
Cap Plates, - - - 0 8	Laced Boots per pair, 1 62 1/2
Cap Scales, - - - 0 60	Shoes, - - - 1 25
Worsted Wings, per pair, 0 55 1/2	Stockings, - - - 0 40
Grey Woollen Overalls, 2 27	Socks - - - 0 21
Drilling overalls, privates 0 87	Leather Stocks, - - 0 14 1/2

Drilling overalls, sergeants 1 00	Blankets, Woollen, - 2 70
Cotton jackets with sleeves, - - - 1 05	Great Coats, - - - 7 00
Infantry privates, - 1 05	Infantry Coats, privates, 5 81
Ditto sergeants, - 1 22	Ditto - sergeants, 5 81
Ditto Artillery privates, 1 11	Ditto - musicians, 7 53
Ditto - sergeants, 1 28	Artillery Coats, privates, 6 00
Woollen Jackets, Artillery, 2 93	Ditto - sergeants, 6 00
Ditto - Infantry, 2 82	Ditto - musicians, 7 72

C. IRVINE, Commissary General of Purchases.

J. C. CALHOUN, Esq. Secretary of War.

#### G.

Report of the Chief Engineer, with Tables D, E, and F.

Engineer Department, November 20, 1823.

Sir: In pursuance of your order of the 5th instant, I have the honour to report the application of the appropriations of this year, referring to the several fortifications, and the Military Academy; the works projected by the Board of Engineers, which have not been commenced, and the estimates of their cost; the present state of the fortifications under construction; the duties upon which the Board of Engineers, and the Topographical Engineers, have been employed during this year; and the condition of the Military Academy.

The accompanying Tables, D, E, and F, and the Reports A and B, afford part of the information proposed above to be furnished by this Report.

Table D exhibits the application of the sums appropriated this year for the several fortifications.

Table E exhibits the amount drawn from the three first quarters of this year, and the amount of accounts rendered for settlement under the respective appropriations.

Table F exhibits the works projected by the Board of Engineers, which have not been commenced, and the estimates of their cost. The projects of a number of works, in addition to those contained in this Table, have been completed by the Board of Engineers, but their Report of them not having been received, they could not be included in the Table, which, as it now stands, does not differ from that reported last year.

Report A, of the Board of Engineers, in conjunction with Commodore Bainbridge of the Navy, relates to the practicability and utility of establishing a Breakwater at the mouth of Delaware Bay, near Cape Henlopen, to form a harbor for the protection of vessels against floating ice and heavy gales. The Report submits two projects, illustrated by drawings, and contains a detailed estimate of the expense for each.

Report B, of the Board of Engineers, exhibits the result of its examination of the harbor of Presque Isle, on Lake Erie, and furnishes a project for the removal of the bar obstructing its entrance, illustrated by drawings and a detailed estimate of the expense of effecting it.

The drawings above referred to are on file in this Department.

The appropriations of the year 1822 for the several fortifications, amounting to \$370,000, and for the Military Academy, amounting to \$13,979, have been expended upon the objects to which they were respectively applicable; and the accounts for the same have been rendered and settled.

All of the amounts drawn in the three first quarters of the year 1823, will have been satisfactorily accounted for, when a small portion of the accounts, not yet rendered for settlement, but duly expected, shall have been received. There has been no defalcation in any of the agents under the Engineer Department; the delay in the rendition of the small portion of accounts not received, having been produced, with respect to those for Rigolets and Chief Menteur, by the failure of the Department to transmit the requisite funds in season, and, with respect to the others, by causes which have been satisfactorily explained.

The several fortifications under construction, and those which have been, since the last Annual Report, commenced, have progressed in as satisfactory a manner as circumstances would permit. The workmanship in every instance is of the most respectable character, and the materials all of the best kind and most durable nature.

Fort Delaware is so far completed that it will be ready to receive its guns and a garrison in the ensuing spring. An unusual degree of sickness prevailed in the Delaware the last fall, whereby the Engineers and men employed at the fort suffered very much, and had for a time to discontinue the works; otherwise this fort



would have been completed within this year: however, its present state is such as, with no great exertions, it might be rendered immediately a formidable defence to the river Delaware. It will be completed in the course of the ensuing season with the remainder of the appropriation applicable to that purpose.

Fort Washington is completed, with the exception of some objects of minor consideration, which the residue of the appropriation is adequate to effect.

Fortress Monroe begins to present a formidable appearance; the exterior wall, ten feet thick at its base, is carried on an average all round the place to the height of twelve feet; and a wet ditch surrounds the whole work. A battery on the covert way is constructed capable of receiving forty-two pieces; and in the three fronts of the fortress on the sea side, embrasures are partly constructed for eighty-four guns; so that in case of necessity a battery of one hundred and twenty six heavy guns might readily be mounted for the protection of Hampton Roads.

The mole in the Rip Rap shoals, on which fort Calhoun is to be erected, has progressed very satisfactorily also. The mole is now about six feet above the water; and has withstood the violence of the sea in such a manner as to prove its solidity and the permanency of the foundation. It already exhibits to the eye the advantages which this position, in connexion with fortress Monroe on Old Point Comfort, possesses in defending Hampton Roads. Great care has been manifested by the Engineers in carrying on these works, and the execution of the workmanship is creditable to the superintending officer.

The work at Mobile Point progresses slowly, but satisfactorily: a large quantity of materials is collected there under the late appropriation.

The works at the Rigolets and Chief Menteur have been prosecuted with all the vigor which the circumstances of the climate would admit. The fort at the Rigolets is nearly completed, and that at Chef Menteur commenced, and well advanced.

The new work at Plaquemine Bend on the right bank of the Mississippi, opposite to Fort St. Philip, called Fort Jackson, has been located, the land around it cleared and drained, and a number of materials collected. This work was also retarded by the sickness which prevailed there last season; but, notwithstanding, the local Engineer reports, that the whole of the sums appropriated to that work will be applied in the course of the month of January next.

The repairs contemplated by the act of Congress of the last session, on Fort Jackson, at Five Fathom Hole, in the Savannah River, below the city, have been completed.

The progress of the Board of Engineers in its labors, comprehending the Topographical Engineers, from the commencement of this year, has been extensive and important. The Board of Engineers has been engaged, in the course of the year, on projects for the defence of Boston, Salem, and Marblehead in Massachusetts; Portsmouth in New-Hampshire; Portland in Maine; and the mouths of Cape Fear River and harbor of Beaufort in North-Carolina; in which period all the plans and estimates for the three first places have been completed; those for Portsmouth carried as far as possible without further surveys; those for House Island and Fort Preble Point, Portland harbor, completed, there being a little more levelling necessary before the other defences of the harbor could be begun; the plans and estimates for the defence of Cape Fear River completed, with the exception of a small work on Federal Point; and those for a work for the defence of Beaufort harbor nearly finished.

The Board, in conjunction with Commodore Bainbridge of the Navy, visited the capes of the Delaware, to examine the practicability of establishing a Breakwater there, for the protection of vessels from ice and tempests; and projected plans and estimates for that purpose. In the course of the summer, the Board examined the harbor of Erie, on Lake Erie in Pennsylvania, with a view to its improvement, and furnished a project and estimate for that purpose. The Board examined the proposed canal from the mouth of the Lehigh river in Pennsylvania to the tide water of the Passaic in New-Jersey, and made a report in detail on the practicability, expense, and advantages, of the canal in a local and national point of view. The Board also entered upon an examination of the proposed canal between the Delaware and Chesapeake in the course of the summer, and are now engaged on the same project.

The Topographical Engineers have been engaged as follows: In surveying Portsmouth harbor, in New-Hampshire; the Patuxent river; the St. Mary's river and harbor; surveying and level-

ling Hawkins' Point and its vicinities, in Maryland; the harbor of Charleston in South-Carolina; in locating the lead mines on the Mississippi, leased to individuals under the law; in ascertaining the practicability of opening a communication between the turnpike in the rear of West Point and the Putnam turnpike, which terminates at Cold Spring on the left bank of the Hudson opposite to West Point; in assisting to ascertain the practicability of opening a communication by canals between the Conewago falls on the Susquehannah, and Baltimore, and between the Conewago falls and tide water of the Susquehannah; and in plottings and drawings relating to the surveys above mentioned, and of others previously made; and also in exploring a part of East Florida; and the western waters by the St. Peter's to the 49th degree of north latitude, thence to Lake Superior and the Saut St. Marie; and in preparing for publication an account of the last mentioned expedition.

The Military Academy, although in a respectable state last year, has since evidently improved in every respect. The regulations which had been under experiment have been fairly tested as to their efficiency; and have, with some additions and modifications, been approved and printed for the use of the institution; so that each individual possessing a copy may conform with exactness and readiness to their injunctions. The number of Cadets at this time attached to the Academy amounts to two hundred and fifty-three, and the number which has been graduated and attached to the Army this year amounts to thirty-six.

Respectfully submitted,

ALEXANDER MACOMB,

Maj. Gen. Chief Engineer.

TABLE D.—Exhibiting the application of the sums appropriated in the year 1823, for the several Fortifications designated.

Designation of the several Fortifications.	Application of the sums appropriated in the year 1823.			
	Am't appropriated.	Amount issued from Treasury in 3 first quarters.	Am't expended in the three first quarters.	Am't applicable to the 4th quarter.
Fort Delaware	\$50,000 00	\$31,500 00	\$29,846 20	\$28,353 80
Washington	46,000 00	23,300 00	19,751 14	26,248 86
Monroe	100,000 00	78,300 00	73,954 25	26,045 75
Calhoun	80,000 00	77,900 00	71,812 68	6,087 32
Fort at Mobile Point, (for collecting materials)	50,000 00	33,500 00	64,153 99	16,500 00
Fort at Rigolets and Chef Menteur	100,000 00	75,000 00	67,273 40	32,726 60
Fort on the right bank of the Mississippi, opposite Fort St. Philip, (for collecting materials, &c.)	40,000 00	15,000 00	8,371 87	31,628 13
Fort Jackson, (for repairing)	8,000 00	4,000 00	3,856 30	Complete'd.
	472,000 00	338,500 00	338,819 83	167,590 46

REMARKS.—On account of the unhealthiness of the climate, the operations at Plaquemine Bend were suspended early in the summer, and were not resumed until about a month ago; but, notwithstanding this interruption, the residue of the appropriation will be absorbed in the course of the ensuing month of January. The operations at the other fortifications have progressed successfully and satisfactorily.

The excess of expenditure at Mobile Point resulted from the application of part of the appropriation for 1822.

The sum of \$50,000, issued on the 7th of October, for Rigolets and Chef Menteur, is included in the \$75,000 stated.

TABLE E.—Exhibiting the amounts drawn for the three first quarters of the year 1823, and the amount of accounts rendered for settlement during the same period, under the respective appropriations designated.

Designation of appropriations.	Am't drawn for the three first quarters of the year 1823.		Am't of accounts rendered for settlement during the same period.	
	Am't drawn.	Am't of accounts rendered.	Am't drawn.	Am't of accounts rendered.
Fort Delaware	\$31,500 00	\$31,950 79		
Washington	24,971 73	22,565 96		
Monroe	84,586 44	65,616 40		
Calhoun	78,343 59	71,812 46		
Fort at Mobile Point, (for collecting materials)	63,500 00	41,933 42		
Fort at Rigolets and Chef Menteur	75,000 00	60,906 00		
Fort on the right bank of the Mississippi, opposite Fort St. Philip	16,372 89	35,398 66		
Repairing Fort Jackson, on Savannah River	4,000 00	3,856 30		
Fortifications	366 42	7,109 19		
Repairs and contingencies of fortifications	10,283 98	13,286 36		
Military Academy	9,371 76	1,563 62		
	407,248 91	358,007 16		

REMARKS.—The appropriations of the year 1822, for the several fortifications, amounting to \$370,000, and for the Military Academy, amounting to \$13,979, have been expended upon the objects to which they were respectively applicable; and the accounts for the same have been rendered and settled.



All of the amounts drawn in the three first quarters of the year 1823, will have been satisfactorily accounted for when a small portion of the accounts, not yet rendered for settlement, but daily expected, shall have been received.

There has been no defalcation in any of the agents under the Engineer Department; the delay in the rendition of the small portion of accounts not received, having been produced, with respect to those for Rigolets and Chef Menteur, by the failure of the Department to transmit the requisite funds in season; and, with respect to the others, by causes which have been satisfactorily explained.

TABLE F.—Exhibiting the works projected by the Board of Engineers, which have not been commenced, and the estimate of their cost.

Designation of the works.	Estimate of their cost.
1st Class.—Fort St. Philip, Louisiana	\$77,810 79
Battery at Bayou Bienvenue	94,582 30
Fort at Soller's Point Flats, (Patapasco River)	673,205 44
Fort at New Utrecht Point, Narrows, N. Y. Harb.	371,970 60
Redoubt in advance of ditto	53,024 72
Fort Tompkins, New-York	420,826 14
Redoubt in advance of ditto	65,162 44
Fort at Wilkins' Point, New-York	456,845 51
Fort at Throg's Point, New-York	471,181 53
Fort at Brenton's Point, Rhode-Island	575,514 10
Redoubt in advance of ditto	154,652 42
Fort at Dumlup's Point, Rhode-Island	579,946 57
Fort at Rose Island, Rhode-Island	82,411 74
Dyke across W. passage, Narraganset Roads	265,000 00
	Dolls. 4,282,134 30
Designation of the works.	Estimate of their cost.
2d Class.—Fort at Grand Terre Louisiana	\$264,517 52
Tower at Pass au Heron, Mobile B.	16,677 41
Tower at Bayou Dupre	16,677 41
Fort at Hawkin's Point, Patapasco River	244,337 14
Fort at St. Mary's, Potomac River	295,602 33
Fort opposite Pea Patch, Delaware, River	347,257 71
Fort on Middle Ground, outer harbour, New-York	1,681,411 66
Fort on East Bank, ditto	1,681,411 66
Fort Hale, Connecticut	31,815 83
Fort Wooster, ditto	27,793 34
Fort Trumbull, ditto	77,445 21
Fort Griswold, ditto	132,230 41
	Dolls. 4,727,177 63
Designation of the works.	Estimate of their cost.
3d. Class.—The rafts to obstruct the channel between Forts	
Monroe and Calhoun	\$240,568 00
Fort on Craney Island Flats	258,465 00
Fort at Newport News	244,337 14
Fort on Naseway Shoal	673,205 44
	Dolls. 1,416,575 58
RECAPITULATION.	
1st class, 14 works, to be commenced as soon as possible	4,282,134 30
2d class, 12 works, to be commenced at a later period	4,727,177 63
3d class, 4 works, to be commenced at a remote period	1,416,575 58
	Dolls. 10,425,887 51

REMARK.—The classification in this table, distinguishing three periods, exhibits the works enumerated in the order of their efficiency to meet the earliest probable emergency.

A.

Report accompanying the Report of the Chief Engineer to the Secretary of War Philadelphia, July 14th, 1823.

In obedience to instructions from the War and Navy Departments, of the 7th of June last, the undersigned having made such personal examination as they found necessary, and collected all the information within their reach, as to the utility, the practicability, the situation, the magnitude, and the cost of a projected Pier or Breakwater, near the Capes of the Delaware, for the protection of vessels against ice, and against the tempests, have the honor to submit the following report :

1st On the utility of a Pier or Breakwater, near the Capes of the Delaware, which will protect vessels against floating ice and wind.

The Delaware Bay is not only obstructed by fixed ice, during a part of the winter, but it is without a harbor near its mouth, in which vessels can secure themselves, either against winds blowing from the N. W. to the S. E. round by the N. or against floating ice. It is frequently the case, that the navigation of the bay is impeded by the ice, as early as the month of December, and it is often open for eight or ten days, and sometimes longer, between the 20th of December, and the 15th of January, yet it closes again and remains shut until the 20th of February, or even the 1st of March. For two months at least, therefore, between December and March, vessels bound up the bay will be uncertain as to their passage to the

city; and, being without shelter when they arrive at the Capes, will be exposed to the greatest dangers, should they find the passage obstructed. As to the vessels departing from this port, it is true, they can choose a favorable moment for descending the river; but should they be met by adverse winds at the Capes, they also will be exposed to be driven ashore by the winds, or destroyed by the ice.

These general considerations show how important it is, that something be done to secure, if possible, a safe anchorage near the mouth of this great communication with the ocean; but, it is proper, by some details, to show more fully in how high a degree this subject merits the attention of government.

From information received through the Chamber of Commerce, it appears, that the tonnage exclusively belonging to, and registered in, the port of Philadelphia, in 1810, when the population of the city and county, amounted to 111,210, was 124,430; and in 1820 when the population amounted to 137,097, was 78,837.

Now, if the tonnage had increased in the same ratio as the population, it would have been, in 1820, 153,394, instead of 78,837: consequently, the tonnage of the port of Philadelphia in 1820, may be said to have been but about half of what it was in 1810.

Though this great diminution is to be ascribed to various causes, there is no doubt that the want of a good harbor at the mouth of the bay, is one of very great influence: owing to this want, many vessels postpone their departure from foreign ports, thereby incurring very great expenses, or, arriving off the Capes at the unpropitious season, are obliged to bear away for some neighbouring port. As to those which run the risk of the passage up the Bay, many are much damaged, and others entirely lost. In the winter of 1809-10, a large number of vessels, in attempting this passage, were either destroyed in the bay by the ice, wrecked upon the shore, or lost at sea, while in pursuit of a harbor of safety. Since that period, the captains have orders not to incur the like risk; and the winter arrivals are comparatively few. The regular packet-ships, which come upon the coast in winter, are often obliged to bear away for New-York, there to land their cargoes, the transportation of which, owing to the badness of the roads at that season, is both tedious and costly.

If there were a harbor at the mouth of the bay, vessels could drop anchor within it, to wait for the first favorable chance to reach New Castle, whence they could easily proceed to Philadelphia, by taking advantage of the openings in the river, between those two places, which occur two or three times every winter. In like manner, vessels despatched from Philadelphia, would descend to New-Castle, and thence to the mouth of the bay; there to wait, if necessary, until the proper moment to proceed to sea.

Besides the embarrassment to commercial intercourse, the loss of time, and the increase of expenses, which are consequent upon the present state of things; the premium of insurance is greatly increased by the dangers to which vessels in winter are exposed at the mouth of the Delaware. This premium is from 1-2 to 1-1-2 per centum, above the customary rate; and in cases which become desperate from the casualties to which vessels are exposed, in the attempt to enter the Delaware, insurance is either refused, or an exorbitant premium demanded.

As to the losses of vessels which have actually happened, for want of a proper shelter, it is difficult, though they have unquestionably been numerous, to determine the number, or to state the amount of property. They can only be ascertained, by research amongst the journals of the period, and amongst the records of the several Insurance Offices, both in this city and elsewhere, to which research, the commission does not feel warranted to devote the time it would require: but thus much appears to be certain, that the ship owners in Philadelphia, in consideration of the trouble, risk, expense, and loss, of the navigation, do not order one in ten of their vessels to this port in winter, and also, that if there were suitable shelter, they would engage with enterprise and confidence, in all the chances of commercial speculation.

Although it is difficult to specify the amount of the losses sustained; although the annual amount has been decreasing with the reduction of the tonnage, and the greater precaution on the part of the merchants; still, some idea may be formed of it from the circumstance, that a single East India or China ship is often worth half a million of dollars, that is to say, two or three times as much as would be the cost of a breakwater, near the Capes, to shelter a dozen vessels.

We have thus far examined the advantages to result from an artificial harbor, with reference only to the commerce of the Delaware; but they will be found of scarcely less moment to the coast-



would have been completed within this year: however, its present state is such as, with no great exertions, it might be rendered immediately a formidable defence to the river Delaware. It will be completed in the course of the ensuing season with the remainder of the appropriation applicable to that purpose.

Fort Washington is completed, with the exception of some objects of minor consideration, which the residue of the appropriation is adequate to effect.

Fortress Monroe begins to present a formidable appearance; the exterior wall, ten feet thick at its base, is carried on an average all round the place to the height of twelve feet; and a wet ditch surrounds the whole work. A battery on the covert way is constructed capable of receiving forty-two pieces; and in the three fronts of the fortress on the sea side, embrasures are partly constructed for eighty-four guns; so that in case of necessity a battery of one hundred and twenty six heavy guns might readily be mounted for the protection of Hampton Roads.

The mole in the Rip Rap shoals, on which fort Calhoun is to be erected, has progressed very satisfactorily also. The mole is now about six feet above the water; and has withstood the violence of the sea in such a manner as to prove its solidity and the permanency of the foundation. It already exhibits to the eye the advantages which this position, in connexion with fortress Monroe on Old Point Comfort, possesses in defending Hampton Roads. Great care has been manifested by the Engineers in carrying on these works, and the execution of the workmanship is creditable to the superintending officer.

The work at Mobile Point progresses slowly, but satisfactorily: a large quantity of materials is collected there under the late appropriation.

The works at the Rigolets and Chief Menteur have been prosecuted with all the vigor which the circumstances of the climate would admit. The fort at the Rigolets is nearly completed, and that at Chief Menteur commenced, and well advanced.

The new work at Plaquemine Bend on the right bank of the Mississippi, opposite to Fort St. Philip, called Fort Jackson, has been located, the land around it cleared and drained, and a number of materials collected. This work was also retarded by the sickness which prevailed there last season; but, notwithstanding, the local Engineer reports, that the whole of the sums appropriated to that work will be applied in the course of the month of January next.

The repairs contemplated by the act of Congress of the last session, on Fort Jackson, at Five Fathom Hole, in the Savannah River, below the city, have been completed.

The progress of the Board of Engineers in its labors, comprehending the Topographical Engineers, from the commencement of this year, has been extensive and important. The Board of Engineers has been engaged, in the course of the year, on projects for the defence of Boston, Salem, and Marblehead in Massachusetts; Portsmouth in New-Hampshire; Portland in Maine; and the mouths of Cape Fear River and harbor of Beaufort in North-Carolina; in which period all the plans and estimates for the three first places have been completed; those for Portsmouth carried as far as possible without farther surveys; those for House Island and Fort Preble Point, Portland harbor, completed, there being a little more levelling necessary before the other defences of the harbor could be begun; the plans and estimates for the defence of Cape Fear River completed, with the exception of a small work on Federal Point; and those for a work for the defence of Beaufort harbor nearly finished.

The Board, in conjunction with Commodore Bainbridge of the Navy, visited the capes of the Delaware, to examine the practicability of establishing a Breakwater there, for the protection of vessels from ice and tempests; and projected plans and estimates for that purpose. In the course of the summer, the Board examined the harbor of Erie, on Lake Erie in Pennsylvania, with a view to its improvement, and furnished a project and estimate for that purpose. The Board examined the proposed canal from the mouth of the Lehigh river in Pennsylvania to the tide water of the Passaic in New-Jersey, and made a report in detail on the practicability, expense, and advantages, of the canal in a local and national point of view. The Board also entered upon an examination of the proposed canal between the Delaware and Chesapeake in the course of the summer, and are now engaged on the same project.

The Topographical Engineers have been engaged as follows: In surveying Portsmouth harbor, in New-Hampshire; the Patuxent river; the St. Mary's river and harbor; surveying and level-

ling Hawkins' Point and its vicinities, in Maryland; the harbor of Charleston in South-Carolina; in locating the lead mines on the Mississippi, leased to individuals under the law; in ascertaining the practicability of opening a communication between the turnpike in the rear of West Point and the Putnam turnpike, which terminates at Cold Spring on the left bank of the Hudson opposite to West Point; in assisting to ascertain the practicability of opening a communication by canals between the Conewago falls on the Susquehannah, and Baltimore, and between the Conewago falls and tide water of the Susquehannah; and in plottings and drawings relating to the surveys above mentioned, and of others previously made; and also in exploring a part of East-Florida; and the western waters by the St. Peter's to the 49th degree of north latitude, thence to Lake Superior and the Saut St. Marie; and in preparing for publication an account of the last mentioned expedition.

The Military Academy, although in a respectable state last year, has since evidently improved in every respect. The regulations which had been under experiment have been fairly tested as to their efficiency; and have, with some additions and modifications, been approved and printed for the use of the institution; so that each individual possessing a copy may conform with exactness and readiness to their injunctions. The number of Cadets at this time attached to the Academy amounts to two hundred and fifty-three, and the number which has been graduated and attached to the Army this year amounts to thirty-six.

Respectfully submitted,

ALEXANDER MACOMB,

Maj. Gen. Chief Engineer.

TABLE D.—Exhibiting the application of the sums appropriated in the year 1823, for the several Fortifications designated.

Designation of the several Fortifications.	Application of the sums appropriated in the year 1823.			
	Am't appropriated.	Amount issued from Treasury in the three first quarters.	Am't expended in the three first quarters.	Am't applied to the 4th quarter.
Fort Delaware	\$50,000 00	\$31,500 00	\$29,646 20	\$28,353 80
Washington	46,000 00	23,300 00	19,751 14	26,248 86
Monroe	100,000 00	78,300 00	73,954 25	26,045 75
Calhoun	80,000 00	77,900 00	71,812 68	6,087 32
Fort at Mobile Point, (for collecting materials)	50,000 00	33,500 00	64,153 99	16,500 00
Fort at Rigolets and Chief Menteur	100,000 00	75,000 00	67,273 40	32,726 60
Fort on the right bank of the Mississippi, opposite Fort St. Philip, (for collecting materials, &c.)	40,000 00	15,000 00	8,371 87	31,628 13
Fort Jackson, (for repairing)	8,000 00	4,000 00	3,856 30	Compl'd.
	482,000 00	338,500 00	338,819 83	167,590 46

REMARKS.—On account of the unhealthiness of the climate, the operations at Plaquemine Fort were suspended early in the summer, and were not resumed until about a month ago; but, notwithstanding this interruption, the residue of the appropriation will be absorbed in the course of the ensuing month of January. The operations at the other fortifications have progressed successfully and satisfactorily.

The excess of expenditure at Mobile Point resulted from the application of part of the appropriation for 1822.

The sum of \$50,000, issued on the 7th of October, for Rigolets and Chief Menteur, is included in the \$75,000 stated.

TABLE E.—Exhibiting the amounts drawn for the three first quarters of the year 1823, and the amount of accounts rendered for settlement during the same period, under the respective appropriations designated.

Designation of appropriations.	Am't drawn for the three first quarters of the year 1823.		Am't of accounts rendered for settlement during the same period.	
Fort Delaware	\$31,500 00		\$31,950 79	
Washington	24,971 73		22,565 96	
Monroe	84,599 44		65,616 40	
Calhoun	78,343 59		71,818 46	
Fort at Mobile Point, (for collecting materials)	63,500 00		41,933 42	
Fort at Rigolets and Chief Menteur	75,000 00		60,906 00	
Fort on the right bank of the Mississippi, opposite Fort St. Philip	16,372 88		25,398 66	
Repairing Fort Jackson, on Savannah River	4,000 00		3,856 30	
Fortifications	366 42		2,109 19	
Repairs and contingencies of fortifications	10,283 98		13,286 36	
Military Academy	8,371 76		1,563 62	
	407,248 01		350,007 16	

REMARKS.—The appropriations of the year 1822, for the several fortifications, amounting to \$370,000, and for the Military Academy, amounting to \$13,979, have been expended upon the objects to which they were respectively applicable; and the accounts for the same have been rendered and settled.



All of the amounts drawn in the three first quarters of the year 1823, will have been satisfactorily accounted for when a small portion of the accounts, not yet rendered for settlement, but daily expected, shall have been received.

There has been no defalcation in any of the agents under the Engineer Department; the delay in the rendition of the small portion of accounts not received, having been produced, with respect to those for Rigolets and Chef-Menteur, by the failure of the Department to transmit the requisite funds in season; and, with respect to the others, by causes which have been satisfactorily explained.

**TABLE F.—Exhibiting the works projected by the Board of Engineers, which have not been commenced, and the estimate of their cost.**

Designation of the works.	Estimate of their cost.
<b>1st Class.</b> —Fort St. Philip, Louisiana	\$77,810 79
Battery at Bayou Bienvenue	94,582 30
Fort at Soller's Point Flats, (Patapsco River)	673,205 44
Fort at New Utrecht Point, Narrows, N. Y. Harb.	371,970 60
Redoubt in advance of ditto	53,024 72
Fort Tompkins, New-York	420,826 14
Redoubt in advance of ditto	65,162 44
Fort at Wilkins' Point, New-York	456,845 51
Fort at Throg's Point, New-York	471,181 63
Fort at Brenton's Point, Rhode-Island	575,514 10
Redoubt in advance of ditto	154,652 42
Fort at Dimpling's Point, Rhode-Island	579,946 57
Fort at Rose Island, Rhode-Island	82,411 74
Dyke across W. passage, Narraganset Roads	205,000 00
	Dolls. 4,282,134 30
<b>2d Class.</b> —Fort at Grand Terre Louisiana	\$264,517 52
Tower at Pass au Heron, Mobile B.	16,677 41
Tower at Bayou Dupre	16,677 41
Fort at Hawkin's Point, Patapsco River	244,337 14
Fort at St. Mary's, Potomac River	205,602 33
Fort opposite Pea Patch, Delaware, River	347,257 71
Fort on Middle Ground, outer harbour, New-York	1,681,411 66
Fort on East Bank, ditto	1,681,411 66
Fort Hale, Connecticut	31,815 83
Fort Wooster, ditto	27,793 34
Fort Trumbull, ditto	77,445 21
Fort Griswold, ditto	132,230 41
	Dolls. 4,727,177 03
<b>3d Class.</b> —The rafts to obstruct the channel between Forts	
Monroe and Calhoun	\$240,568 00
Fort on Craney Island Flats	258,465 00
Fort at Newport News	244,337 14
Fort on Naseway Shoal	673,205 44
	Dolls. 1,416,575 58
<b>RECAPITULATION.</b>	
1st class, 14 works, to be commenced as soon as possible	4,282,134 30
2d class, 12 works, to be commenced at a later period	4,727,177 03
3d class, 4 works, to be commenced at a remote period	1,416,575 58
	Dolls. 10,425,887 91

**REMARK.**—The classification in this table, distinguishing three periods, exhibits the works enumerated in the order of their efficiency to meet the earliest probable emergency.

#### A.

Report accompanying the Report of the Chief Engineer to the Secretary of War  
Philadelphia, July 14th, 1823.

In obedience to instructions from the War and Navy Departments, of the 7th of June last, the undersigned having made such personal examination as they found necessary, and collected all the information within their reach, as to the utility, the practicability, the situation, the magnitude, and the cost of a projected Pier or Breakwater, near the Capes of the Delaware, for the protection of vessels against ice, and against the tempest, have the honor to submit the following report:

1st On the utility of a Pier or Breakwater, near the Capes of the Delaware, which will protect vessels against floating ice and wind.

The Delaware Bay is not only obstructed by fixed ice, during a part of the winter, but it is without a harbor near its mouth, in which vessels can secure themselves, either against winds blowing from the N. W. to the S. E. round by the N. or against floating ice. It is frequently the case, that the navigation of the bay is impeded by the ice, as early as the month of December, and it is often open for eight or ten days, and sometimes longer, between the 20th of December, and the 15th of January, yet it closes again and remains shut until the 20th of February, or even the 1st of March. For two months at least, therefore, between December and March, vessels bound up the bay will be uncertain as to their passage to the

city; and, being without shelter when they arrive at the Capes, will be exposed to the greatest dangers, should they find the passage obstructed. As to the vessels departing from this port, it is true, they can choose a favorable moment for descending the river; but should they be met by adverse winds at the Capes, they also will be exposed to be driven ashore by the winds, or destroyed by the ice.

These general considerations show how important it is, that something be done to secure, if possible, a safe anchorage near the mouth of this great communication with the ocean; but, it is proper, by some details, to show more fully in how high a degree this subject merits the attention of government.

From information received through the Chamber of Commerce, it appears, that the tonnage exclusively belonging to, and registered in, the port of Philadelphia, in 1810, when the population of the city and county, amounted to 111,210, was 124,430; and in 1820 when the population amounted to 137,037, was 78,837.

Now, if the tonnage had increased in the same ratio as the population, it would have been, in 1820, 153,394, instead of 78,837; consequently, the tonnage of the port of Philadelphia in 1820, may be said to have been but about half of what it was in 1810.

Though this great diminution is to be ascribed to various causes, there is no doubt that the want of a good harbor at the mouth of the bay, is one of very great influence: owing to this want, many vessels postpone their departure from foreign ports, thereby incurring very great expenses, or, arriving off the Capes at the unpropitious season, are obliged to bear away for some neighbouring port. As to those which run the risk of the passage up the Bay, many are much damaged, and others entirely lost. In the winter of 1809-10, a large number of vessels, in attempting this passage, were either destroyed in the bay by the ice, wrecked upon the shore, or lost at sea, while in pursuit of a harbor of safety. Since that period, the captains have orders not to incur the like risk; and the winter arrivals are comparatively few. The regular packet-ships, which come upon the coast in winter, are often obliged to bear away for New-York, there to land their cargoes, the transportation of which, owing to the badness of the roads at that season, is both tedious and costly.

If there were a harbor at the mouth of the bay, vessels could drop anchor within it, to wait for the first favorable chance to reach New Castle, whence they could easily proceed to Philadelphia, by taking advantage of the openings in the river, between those two places, which occur two or three times every winter. In like manner, vessels despatched from Philadelphia, would descend to New-Castle, and thence to the mouth of the bay; there to wait, if necessary, until the proper moment to proceed to sea.

Besides the embarrassment to commercial intercourse, the loss of time, and the increase of expenses, which are consequent upon the present state of things; the premium of insurance is greatly increased by the dangers to which vessels in winter are exposed at the mouth of the Delaware. This premium is from 1-2 to 1-1-2 per centum, above the customary rate; and in cases which become desperate from the casualties to which vessels are exposed, in the attempt to enter the Delaware, insurance is either refused, or an exorbitant premium demanded.

As to the losses of vessels which have actually happened, for want of a proper shelter, it is difficult, though they have unquestionably been numerous, to determine the number, or to state the amount of property. They can only be ascertained, by research amongst the journals of the period, and amongst the records of the several Insurance Offices, both in this city and elsewhere, to which research, the commission does not feel warranted to devote the time it would require: but thus much appears to be certain, that the ship owners in Philadelphia, in consideration of the trouble, risk, expense, and loss, of the navigation, do not order one in ten of their vessels to this port in winter, and also, that if there were suitable shelter, they would engage with enterprise and confidence, in all the chances of commercial speculation.

Although it is difficult to specify the amount of the losses sustained; although the annual amount has been decreasing with the reduction of the tonnage, and the greater precaution on the part of the merchants; still, some idea may be formed of it from the circumstance, that a single East India or China ship is often worth half a million of dollars, that is to say, two or three times as much as would be the cost of a breakwater, near the Capes, to shelter a dozen vessels.

We have thus far examined the advantages to result from an artificial harbor, with reference only to the commerce of the Delaware; but they will be found of scarcely less moment to the coast-



ing navigation of the nation at large. The great number of shipwrecks upon the coast of Jersey and Delaware proves that the winter navigation of that coast, is attended with imminent peril; and we may safely affirm, that a project which shall place a secure harbor at the mouth of the Delaware, lying, as it will, about midway between the distant harbors of New-York and the Chesapeake, and being always accessible, with the winds which are most dangerous, will produce a result of incalculable value, whether we consider the saving of property, or of human life.

2d. On the practicability of constructing a pier or breakwater, which will afford shelter for vessels, and have, in itself, such stability as to resist the most violent efforts of floating ice, and of gales of wind.

The commission have ascertained that the ravages of the worm, in the lower part of the bay, would soon destroy any wall, in which timber entered as an essential part; and they are convinced, were it otherwise, as respects timber, no dependence could be placed in the stability of a work, having an envelope of timber, unless such a form were given to it as would, in fact, make the envelope a very expensive, and, at the same time, a nearly useless appendage. The form here spoken of has reference to the profile or transverse section, and is one in which the breadth at bottom, being very great, compared with that at top, the slopes of the sides are so gentle, that the stone composing the mass are retained firmly in place by their own weight: to this form of structure has been applied, in a memorable example, where the objects in view were similar to the present, the term of breakwater.

With the complete success which has attended the stupendous works of the Jetté of Cherbourg, and the Breakwater of Plymouth, (just alluded to,) the Commission cannot hesitate as to the practicability of constructing a breakwater in the Delaware, which will be lasting in itself, and secure permanently the advantages which are sought. This confidence is founded on a comparison of the exposure of the works above cited, with the exposure of the situation which may be selected in this bay, on a comparison of the nature of the bottom, and the direction and force of the tides; and, on the advantages we shall derive from a knowledge of the difficulties encountered; the manner in which they were overcome; and the very faults of design and execution in those great works.

3d. On the situation which the proposed breakwater should have: As the dangers, from which the breakwater is to be a guard, are encountered at the very mouth of the Delaware, it is obvious that a situation for it must be selected as near the Capes as possible; and, it must be here added, that its utility, as respects the coasting navigation, depends on this condition. Over all the broad expanse of water which separates the Capes of the Delaware, but two situations occur where an artificial harbor could be constructed, with any hope of advantage; and the first of those, namely, the roadstead under Cape May, is too shallow; its access is attended with too much danger; and it is too much aside from the main channel, up and down the bay, to require further mention.

The other situation is the roadstead between the Shears and Cape Henlopen; and referring to chart herewith to illustrate the subject more in detail, we will now describe this roadstead.

A shoal called the Shears lies just within the Capes of Delaware, and about three miles from the Cape Henlopen shore; though it is so delineated upon existing maps, it is by no means an insular shoal; but it is the seaward part of an extensive bank, making out from the Delaware shore, at and near the mouth of Lewistown Creek; the ridge or shoalest part of this bank runs from Low-Plumb-Point, first northeasterly 2 1-4 miles, then easterly 2 1-2 miles, and lastly, southeasterly 3 1-4, making the length of the bank from Low-Plumb-Point following the course of the ridge, about 8 miles. Its breadth is variable—of that part called the Shears, the extreme breadth is nearly two miles; from the tail of the Shears to Cape Henlopen is 2 1-2 miles. Considering the shoal limited, as in the chart herewith, by 3 1-2 fathoms at low water, the soundings upon it vary from that depth to one foot. South of the tail of the Shears, and separated from it by a narrow channel of 4 1-2 to 5 fathoms, lies a small shoal, having about 18 feet water. It is between the great bank or shoal and the Delaware shore, and having for its outline the opposite concavities of the shoal and the shore, that the roadstead above mentioned is found. The average depth within the road is about 4 1-2 fathoms, and at its mouth about 6 fathoms at low water.

Though highly important and valuable in many respects, this road is, nevertheless, much exposed to certain winds, and entirely so to floating ice; on consulting the chart herewith, it will be seen that easterly winds blow directly through the chaps of the road-

stead, and that the direction of the ebb-tide sweeps into and through it a large part of the ice of the bay; it was to guard against this latter danger, chiefly that the project now before the Commission was first conceived.

We come now to the consideration of what particular part of this roadstead is most suitable for the creation, by means of a breakwater, of an artificial harbor, which, at a minimum expense, will fulfil all the essential conditions of such an establishment. These conditions are, 1st. Security from winds. 2d. Security from ice. 3d. Security from an enemy.

As to the first condition, if a position be taken at A, on the southern margin of the Shears, it will be sufficiently under the lee of the main to be protected from all winds from S. E. by S. to W. (round by the S.) and by the shoal off Low-Plumb-Point and the Shears proper, it will be so much protected from winds blowing from W. to E. (round by the N.) that the profile of this part of the breakwater may be made comparatively weak, and at small expense against winds from E. to S. E. by S. (South by) the breakwater alone must afford protection, and must be made proportionably strong. A breakwater so constructed here as to guard against winds, will also afford security against ice, and thereby fulfil the second condition. As to the 3d condition, however, it would be defective; the distance from the main is too great for it to be well defended by works upon the shore, and fortifications upon the spot itself would involve considerable expense.

The condition of complete security from an enemy obliges us therefore to abandon this position, and to seek for one, not otherwise objectionable, nearer the shore.

Referring now to the plan marked B, just within the pitch of Cape Henlopen, it will be seen that a harbor there will be entirely sheltered from all winds from E. to W. N. W. (round by the S.) but, being distant from the Shears, will not be sensibly benefited by the lee of that shoal, and, consequently, will require a strong breakwater against all winds from the other thirteen points of the compass. In this position, as in the other, the embankment against the winds and waves may be so contrived as to give entire security from the ice, while its proximity to the shore will enable a fort, properly situated there, to protect it against all enterprises of an enemy.

In the selection which, under all circumstances, the Commission make of this last position B, for the artificial harbor, they adopt the hypothesis, that the expense, though great, will not be disproportionate to the magnitude of the benefits to result, in common, to the commerce of the nation, and to that of the Delaware; and the Commission cannot hesitate as to the correctness of the hypothesis. But it often happens that works of the utmost national importance, are necessarily postponed or neglected, for want of means in the government, or that they are for the same reason, or because their success is half problematical, carried on slowly, or attempted but partially. From these considerations, in connexion with the great expense of a complete breakwater, the Commission have been induced to seek for some mode of securing a partial benefit, at a cost so moderate, as, under any circumstances, to warrant the undertaking. They rather infer this to be their duty, from the small appropriation to the object in view, in the law of Congress which accompanied their instructions. The Commission are not, however, to question the ability, nor to judge of the disposition of the nation in this respect; but furnishing the best information they can obtain, and their own deliberate opinion, in reference both to a complete and a partial work, to lay the matter fairly before the government for its decision. Two projects will, therefore, be presented; one, designed to afford a complete, spacious, and defensible harbor; the other intended to protect, at a minimum of expense, a limited number of vessels.

The situation for the first, has already been described. On examining for a proper site for a small breakwater, the Commission found the conditions of security from ice and winds not easily reconcilable with that of security from an enemy, there being no place near the shore in which a small breakwater can be made, to guard against both ice and wind.

The course of the ebb tide is there nearly parallel with the shores, the breakwater, therefore, which should be so placed as to arrest and deflect the floating ice, would leave the vessels, intended to be covered, still exposed to the action of the north-easterly gales; consequently an equal length, at least, would be required against the winds as against the ice. A harbor for three or four vessels would not be made under these circumstances, without a very considerable development of breakwater.



Going to the opposite side of the roadstead, however, we find, that the Shears, being themselves a good breakwater against the northerly, northeasterly, and easterly winds, (with the help of certain means, hereafter recommended,) an embankment against the ice alone, will give a harbor of considerable capacity, which will be safe, as to both ice and winds. It is true, that, in resorting to this position, we relinquish the condition of entire safety from an enemy, only to be attained near the shore; but, it is also true, so far as our judgment is correct, that there is no alternative.

A few observations will be made here, however, as tending to diminish the objection to this position. 1st, A battery of heavy guns and sea mortars upon the shore would make the situation of an enemy's vessels, even in the harbour, something hazardous, and would bear, with much effect, upon his vessels, when attempting to enter, or to leave the roadstead. 2d, Should an enemy succeed in stationing his ships within the harbor, and not be molested while there, either by works on the shore, or by the floating defenses, which would, in time of war, be stationed near the mouth of the bay, he would not be able to enforce a blockade, without passing, in every attempt, within range of the works. 3d, The object of an enemy being to blockade the bay, he would derive but little advantage from the harbor; because, during eight or ten months in the year, a man of war would find safe anchorage over every part of the surface of the bay; and hence, if it be considered important to prevent the blockade, a floating force must, in every case, be provided. 4th, and lastly, As the advantages of the harbor become more apparent, the commerce benefited by it more extensive, and the means of the country more ample, the harbor may be progressively enlarged, and a battery erected upon the Shears, for its protection.

#### Fourth. On the extent and form of the breakwater.

1st. As to the complete harbor at the position B.

Going far enough from the shore to leave about half a mile in breadth, of good anchorage, we draw the line *bc*, of 740 yards. The direction of this line must be such, that the course of the ebb tide will make, with it, a very oblique angle. From the western extremity of this line, we draw the line *ab*, (towards the shore,) at an angle of 135 deg. to which we give a length of 450 yards; and from the eastern end, we draw the line *cd*, at the same angle, of 580 yards in length. It will be seen, by an inspection of the chart, that the ice which will strike a breakwater, made according to the above delineation, will be deflected outwardly, while that which passes within the extremity *b* will course along near the shore, leaving a broad space entirely clear. It will be seen too, that, while by the shore or the breakwater, all winds will be entirely excluded except the east-northwestwardly, that there will be a large space secure even from these. The area of this harbor will be about half a mile square; the mean depth at low water being 28 feet, the whole length of the breakwater will be one mile. The bases of the interior slopes of this work will be one half the altitudes: but the exterior, being exposed to a heavy sea, will require for the slopes bases of four times the altitudes. The side facing the northeast will be finished at high water mark, while the other two sides must be raised three feet higher, to keep the ice from being forced over into the harbor.

2d. As to the partial breakwater at the position A.

From the point *c*, which is in about 12 feet water, we draw the line *ef*, of 1,100 feet, so as to form with the course of the tide an angle of 120 deg. This line is so far up the roadstead, that a vessel anchored behind it at the distance of 800 yards, will be protected from E. S. E. winds by the lower part of the shears; and here it is proper to remark, that the winds blowing from between E. S. E. and S. E. are neither violent nor of long continuance. It will be perceived on the chart, that, from the direction we have given to the breakwater, the descending ice will be deflected towards the deepest water and strongest current, and that vessels, to the number of twelve, moored in two lines behind the breakwater, will be protected either by the shoal or by the main land, from all winds, excepting those just mentioned.

It has frequently been remarked above, that the shoal itself is a good breakwater, and there is no doubt that vessels, provided with good ground tackle, could ride under its lee in safety; but it is proper to provide against deficiency in this respect, which may be often expected with merchant vessels; therefore, the Commission propose to fix, in addition to the breakwater, two lines of heavy anchors, connected with buoys, by strong chain cables. These buoys, cables, and anchors, will not only enable vessels to ride in safety, but the buoys will guide the vessels as they arrive at their proper stations in the harbor, thereby ensuring the greatest

economy of space. The length of the line of breakwater is just sufficient to cover the vessels from the passing ice, when they happen to be riding with a scope of sixty fathoms parallel to the breakwater.

The mean depth in the harbor, at low water, will be 21 feet.

As this work will not be exposed to a violent sea from any direction, it is considered sufficient to make the base of each slope equal to twice the altitude.

#### 5th. Estimate of the Expense of a Breakwater.

1st. As to a complete harbor at the position B.

In the left flank of the breakwater, there will be,

		5,817,975 cubic feet.
In the centre of	do.	11,346,420 do
In the right flank	do.	9,744,251 do
Total,		26,908,646 cubic feet.

26,908,646 cubic feet equal to 996,616.52 cubic yards. One perch, or 24.75 cubic ft. at \$3.00, is 2.1818 per cubic y'd; 996,616.52 cubic yards of stone, promiscuously thrown in to form the mass, each stone weighing from 1.2 to 4 tons; for materials and labor, at \$2.1818 per cubic yard, 2,174,417 92

Add for unforeseen expenses 7 per centum, 152,209 25

Total expense of complete breakwater, \$2,326,627 17

2d. As to the expense of a partial harbor at the position A.

In the whole of the line of breakwater there will be 2,585,536 cubic feet, or 95,760.592 cubic yards.

One perch, or 24.75 cubic feet, at \$2, is \$2.1818 per cubic yard; 95,760.592 cubic yards of stone, promiscuously thrown in to form the mass, each stone weighing from 1.2 to 4 tons; for materials and labor, at \$2.1818 per cubic yard, 208,930 40

Add for unforeseen expenses 5 per cent. 10,446 52

Cost of breakwater, \$219,376 98

Add for moorings:

12 cast iron anchors, each of 30cwt. at \$70 per ton,	1,260 00
12 chain cables, of 12 fathoms each, of 1 1/2 inch iron; at one end of each chain a ring, of 12 inches diameter in the clear, to be made of two inch iron, to receive the end of the vessel's cable, which rings should be puddened = 144 fathoms, at \$10 50 per fathom.	1,512 00
12 buoys for the chains, say at \$30,	360 00
	3,132 00

Total expense of partial breakwater and moorings, \$222,508 98

On concluding this report on an artificial harbor, the commissioners take the liberty of recommending to the notice of government some other matters, which, though not within the reach of their instructions, are not only important in themselves, but strictly analogous in their tendency to those they have been considering: These are,

1st. The necessity of a Beacon Light near the extremity of Cape Henlopen.

The light on this Cape is elevated near 200 feet above the level of the ocean, and is at least one mile from the pitch of the Cape. In connection with the circumstances of elevation and distance, it is difficult, in nights which are too dark for the very low margin of the Cape to be seen, to guard against an optical delusion, as to the distance of the vessel from the shore; and the error is most apt to be on the unsafe side; hence, vessels have often been suddenly run upon the Cape, which were supposed to be in mid-channel of the roadstead. The soundings give no indication of proximity, as bold water is found at the very edge of the shore.

2d. The necessity of a permanent Light-House on the lower end of the Brandywine Shoal.

The importance of a light on this position has been made evident to Congress, as appears by an appropriation for a floating light. But, though this floating light will, doubtless, answer all purposes during the greater part of the year, it is certain that it will be destroyed, unless removed at the approach of each season of floating ice; and hence, as that is the season of most violent gales, and of greatest damage, it will be away when perhaps most necessary.



The Commission do not hesitate, as to the practicability of fixing a permanent light-house, (which need be but 20 or 25 feet high,) on the point indicated. It is essential to remark here, that at the period when the floating light will be removed from its station, all buoys, and other signals of sub-marine dangers, will, also, for the same reasons, be wanting to direct the navigator.

3d. The importance of having, without delay, a correct hydrographic chart, made of the whole bay and river.

Of all the navigable communications from the sea to the interior, within the United States, that up this bay and river is most intricate, and most beset with unseen dangers; and there is none, probably, more imperfectly known. The pilots, it is true, are acquainted with certain channels well enough to conduct vessels at a favorable time, with safety; but it is far from certain that they know these thoroughly, or that these are the only or the best.

The great distance and small elevation of the shore, and the similarity in the soundings and composition of the shoals, make it very difficult at times, to hit or keep in the best water, even to the pilots. A chart of the bay and river, which would exhibit a true outline of the shores, with all the land marks, the courses and widths of the several channels; the set of the tides; the influence of the moon and of winds upon the rise of tide in different parts of the bay; the place, extent, and form, of all ledges, banks, and shoals; the soundings and nature of the bottom, both on the shoals and in the channels; the harbors and anchorages; exact and perspicuous sailing directions, &c. &c.—such a chart would not only greatly add to the knowledge and utility of the pilots, but with the help of proper signals, buoys, &c. would enable intelligent masters of vessels to enter with confidence upon the navigation, when, as sometimes happens in stress of weather, they could neither obtain pilots, nor keep the sea with safety.

It will not be out of place here, to advert to the facilities as to the pilotage of the bay, which will be afforded by the partial harbor. The pilots of Cape Henlopen are provided with pilot boats and whale boats; with the former they cruise in fine weather, sometimes out of sight of land; in bad weather, though some have been lost by pursuing their cruises too long, they retire to Lewistown behind the Cape Henlopen, and depend on signals at the Light-house, to inform them of the approach of vessels. On these signals being made, they start in the whale boats; but the distance is so great, that vessels are frequently in danger and sometimes lost, before they can board them. Anchored under cover of the partial breakwater, however, the pilots would be enabled to get to sea in time, with their largest classes of boats, thereby materially diminishing the risk to the arriving vessels and to themselves. All which is respectfully submitted.

BERNARD, Brigadier General.

JOS. G. TOTTEN, Maj. Eng. Br. Lt. Col.

WM. BAINBRIDGE, United States' Navy.

Accompanying this Report there are three plans, viz.

- A chart of part of Delaware Bay near Cape Henlopen.
- Plan and profiles of a complete breakwater for the position B, near Cape Henlopen.
- Plan and profile of a partial breakwater for the position A, near Cape Henlopen.

Report of the Board of Engineers, for the improvement of the Harbor of Erie

#### LIST OF DRAWINGS ACCOMPANYING THE REPORT.

1. Sketch of Lake Erie.
2. 3. Details of Dyke, Embankments, and Piers.
4. A chart of Presque Isle Bay, (Erie Harbor.)  
To which is annexed,
5. An estimate on the supposition that the current will deepen the channel. And
6. An estimate on the supposition that dredging must be resorted to.

B.  
Brevet Major-General Alexander Macomb, Colonel Commanding United States Engineers.

New-York, October 4, 1823.

SIR: The board of Engineers, under orders of the 7th of May, 1823, have lately examined the harbor of Erie, Pennsylvania, with a view to its improvement, for the purpose of navigation, and they now submit the following Report:

The harbor of Erie, or Presque Isle Bay, is formed by a sand-bank which makes out from the main shore, about four miles west-

wardly of the town of Erie. This sand-bank, near the shore, is narrow and low, and pursues about a N. E. direction: having advanced two miles into the Lake, it suddenly widens to two-thirds of a mile, but pursues the same direction for another mile, when it gradually increases in width to one mile, and gradually changes its direction to an eastern course, terminating north of the town of Erie in two narrow points, having a small and well-enclosed harbor between them. The greater part of this sand bank, (significantly called Presque Isle,) is covered with wood. The basin lying between this bank and the main, is about half a mile wide, and four miles long; a great part of it being deep enough even for frigates.

In continuation of Presque Isle, there is a sand-bank under water, nearly a mile wide, which runs in a S. E. direction to the shore of the main, a little eastward of the town of Erie, reducing the depth of water, in this part, (the mouth of the basin) to about six feet on the average. A narrow and winding channel runs through this bank, in which there is from five to nine feet of water.

It will be seen, by the above description, and by reference to the map herewith, that this secure and beautiful harbor is inaccessible, except to vessels of the lightest draught, and therefore of no great value, either to the trade of the town of Erie or to the commerce of the Lake; and it remains, now, to examine whether any expedient can be adopted, by which, at a reasonable expense, the draught of water over this bank or bar will be augmented.

The basin of Presque Isle is situated so far above the commencement of the falls into Lake Ontario, and in so wide a part of Lake Erie, that the current produced by the escape of water at the falls is here insensible: the only currents here observable being entirely owing to the easterly or westerly winds. These latter currents have, however, sometimes considerable rapidity; and a curious fact appears in relation to the effect of these lake currents upon the waters of the basin, viz. that a strong current sets into the basin, in direct opposition to the westerly winds when they blow hard; and, conversely, a strong current sets out of the basin, in direct opposition to violent easterly winds; or, in other words, the current out of, or into, the basin, runs in a direction opposite both to the set of the lake current and the direction of the winds, whether easterly or westerly.

It is important to account for this, before proceeding further; and, in doing so, we refer to the sketch herewith, to make the matter more intelligible.

We first must suppose the surface of the lake, and of the basin, to be of the same level, as will always be the case, after a few days of calm weather, and represent this level by 0° 0' 6" and 0". An easterly wind then setting in, drives a part of the water of the eastern half of the lake, into the western, raising the surface at 0' and 0", and lowering it at 0'; as the surface descends at 0', the water in the basin must also descend, by running out against the wind, there being no issue at the west end of the basin.

In like manner, when a westerly wind heaps the water at 0' above the surface in the basin, it must rise in the basin by running in against the wind, there being no entrance at the west end.

As the winds abate, the waters gradually take a level common to both lake and basin; but not the same as before, for, (the supply being nearly equable at all times,) with westerly winds, more is forced out of the lake over the falls, and with easterly winds less pass that way than when the surface is at a mean elevation. The basin has, therefore, higher to rise, immediately after an easterly wind, than it was depressed by it: and lower to fall, after a westerly wind, than it was elevated by that wind. But the return of the lake to its level is slow and gradual; the elevation and depression of the waters at its ends, is sudden and violent, and amounts often to several feet. It is to this latter operation, therefore, that we are to look to for producing any considerable effect.

Having now become acquainted with the causes of the currents of the basin, and their operation, we will endeavour to ascertain if they can be turned to account in deepening the water on the bar, at the mouth of the basin.

Whether that bank is coeval with the Presque Isle in the form in which it now appears, or not, matters little, so long as we may safely infer, that its present state, being that in which it has always been known with little deviation, is owing to causes which are evident, and some of which can be in a measure controlled—these causes are the inertia of the matter composing it; the force of easterly winds and the strength of the basin currents.

(To be continued.)